CERTETA
RESEARCH CENTRE IN
SHEET METAL FORMING TECHNOLOGY

Established in 2000
Certified CNCSIS in 2002

Director: Prof. Dr. –Ing. Dorel BANABIC
- Material behavior of metallic materials
- Simulation of sheet metal forming processes
- Design of sheet and tube metal forming technologies
- Experimental techniques in material forming
- Virtual fabrication

Competences
- Research team:

• Professors: 5
• Readers: 4
• Lecturers: 2
• Postdocs: 4
• PhD students: 10

Human resources
Experimental facilities

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Technical University of Cluj Napoca
Department of Manufacturing Engineering

Erichsen deep-drawing device  ARAMIS System  Zwick tensile testing machine  Instron tensile testing machine  Benedetti press

Panoramic view of the CERTETA laboratory

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Representatives research projects


• 2007 – 2010 Modelling of the Forming Limit Bands, a new tool of the virtual fabrication in the sheet metal forming processes, PN II-Ideas Program

• 2008 – 2010 Advanced models for the description of the plastic anisotropy and formability of thin metallic sheets, PN-II Human Resources- Excellences Projects for Researchers Reintegration

• 2010 – 2013 From micro to macro - continuum scale modeling of advanced materials in virtual fabrication, Complex Exploratory Research Projects PCCE, PN II-Ideas Program

Internal research projects

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Realization of a function BBC_PARAMS for computing the parameters of the BBC2003 model out of given material data. 3D extension of the BBC2005 yield criterion

Financed by AutoForm Engineering GmbH, Switzerland.

Virtual Intelligent Forging-CA within the framework FP6 Financed by European Community, Contract no. NMP2-CT-2004-507331.

Sheet metal formability for special metal forming processes, Joint research project between Institute for Metal Forming Technology, Stuttgart University and CERTETA, Financed by Humboldt Foundation, Germany.

Improvement of performances of formability models for sheet metals using new constitutive laws, Joint research project between Institute of Virtual Manufacturing, ETH Zurich and CERTETA, Financed by Swiss National Foundation.

Virtual Factory Framework, FP7 Collaborative Project - Large-scale integrating project, FP7-NMP-2008-LARGE-2

External research projects
The impact of the scientifical results and the international visibility of CERTETA center
CERTETA center is the headquarter of the European Scientific Association for Material Forming

ESAFORM

www.esaform.org

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Material data user graphic interface in the AUTOFORM 4.1 FE commercial code
Simulations of production part from VOLVO V30 using H180BD steel (Corus)
UMMDp platform developed by the Japan Association for Non-linear CAE

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The most representative publications of the past 5 years
• 4 books published in international publishing houses (Springer and Hermes-Lavoisier)

• 6 contributions in books published in international publishing houses (Springer and Wiley)

• 3 books in national publishing houses


The most representative publications
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Contents

Preface
1 Elements of Crystal Plasticity
2 Crystallographic Texture and Plastic Anisotropy
3 Formability Testing
4 Anisotropy of Sheet Metal
5 Forming Limits of Sheet Metal
6 Workpiece Properties after Metal Forming
7 Simulation of Metal Forming

Appendix Theoretical Models of the FLD’s

Being translated in Chinese

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Contents

- New and advanced numerical strategies in forming process simulation;
- Sheet metal forming technologies and modeling;
- Anisotropy and formability of materials;
- Polymer processing and modeling;
- Composite forming technologies and modeling;
- Superplastic forming.
Co-authors from:

• ETH Zurich, Switzerland
• Goteborg University, Sweden
• Autoform Co., Zurich, Switzerland
• Volvo Co., Sweden

Being translated in Chinese
To be published in 2013

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• University of Stuttgart, Germany
• Tokyo University of Technology, Japan
• POSTECH University, Korea
• Catholic University Leuven (KUL), Belgium
• ETH Zurich, Switzerland
• Technological University of Harbin, China
• AUTOFORM Co., Zurich, Switzerland
• Daimler Co., Sindelfingen, Germany
• Renault Technocenter, Guyancourt, France
• Virtual Vehicle, Graz, Austria

International colaborations of CERTETA
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